



O'BRIEN & GERE
ENGINEERS, INC.

November 15, 2002

Mr. David O. Lederer
Remedial Project Manager
Environmental Protection Agency (HBO)
Region 1
1 Congress Street, Suite 1100
Boston, MA 02114-2023

Re: Sullivan's Ledge Superfund Site
Corrective Action Design

File: 5509/28602 #2

Dear Mr. Lederer:

This letter presents the Corrective Action Design for a system to control migration of landfill gas from the Sullivan's Ledge Superfund Site in New Bedford, Massachusetts. This submittal revises our letter of October 17, 2002 to address agency comments, which were discussed in our conference call on October 30, 2002. Pursuant to the Corrective Action Alternatives Analysis presented in our September 30, 2002 letter, the recommended option is active gas extraction, to be implemented as an interim action. The components of the proposed extraction system are described below, followed by a summary of the monitoring program being proposed to collect data on the system's performance.

Gas Extraction System

Investigations have shown that landfill gas is migrating from the west and east sides of the Sullivan's Ledge Site. Nearby slab foundation structures include the Day's Inn hotel on the west side, and Rosie's Restaurant near the northeast corner of the landfill. Active gas extraction will initially be conducted by inducing a vacuum on existing gas vents on the west side (GV-8, GV-12, GV-13, and GV-14) and in the northeast portion (GV-1) of the site. The attached Figure 1 shows the locations of existing gas vents and monitoring wells. Presently, vents GV-8, GV-12, GV-13, and GV-14 are connected by a below grade header. The extraction system will be connected to vent GV-8 and GV-1. Vents GV-12, GV-13, and GV-14 will be temporarily capped off to prevent short-circuiting due to intake of outside air into the vents once a vacuum is applied at GV-8. As part of system monitoring, periodic vacuum measurements will be made at GV-12, GV-13, and GV-14 to assess the whether the blower connection at GV-8 is effective in creating a negative pressure condition along the west side of the landfill.

In addition to capping off vents GV-12, GV-13, and GV-14, which are directly connected to vent GV-8, it may be necessary to cap off other nearby vents, which are tied into the sand gas venting layer of the landfill cap, to prevent the intake of fresh air to the system. This determination will be made in the field after the system is started up and vacuum monitoring begins. The extraction system will include a trailer-



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mounted blower package equipped with a control panel, inlet control valves, sampling ports, discharge stack, and condensate collection pot. The blower will be driven by an 8 HP, 460V motor, and will be capable of discharging approximately 200 CFM at a vacuum of 60 inches of water. The components of the blower system package are explosion-proof and spark-proof. A three-phase electrical feed will be run from the existing lighting panel in the ground water treatment plant to the location of the blower system, near vent GV-8.

The existing gas vents will be connected to the inlet of the blower using lengths of 6-inch PVC pipe and fittings. Flexible couplings (Fernco style) will be used to connect the PVC piping to the vents. Butterfly valves will be installed on the piping between the blower and vents GV-8 and GV-1 to enable balancing of the system, or to allow the blower to operate on either of those vents individually.

The discharge from the extraction system will be vented directly to the atmosphere, without off-gas control. Based on the total VOC concentrations detected in Summa canister samples collected from gas monitoring wells GM-2R, GM-5, and GM-20 in July 2002 (42.1, 5.4, and 15.1 mg/m³, respectively), the total VOC discharge has been estimated at approximately 136 lb/yr (0.07 tons/yr). Air emissions are regulated under 310 CMR 7.00 (the Massachusetts Air Pollution Control Regulations) if they exceed 1.0 ton/yr, or if they create an air pollution condition and therefore no air approval is anticipated to be required. In addition, as described below, air monitoring will be performed for methane, hydrogen sulfide, and VOCs to confirm that there are no exceedances of health-based standards, and actions are specified should any exceedances occur. It is therefore anticipated that untreated emissions will be below a level of significant risk to health, safety, public welfare, and the environment.

In the process of extracting landfill gas, condensate will be generated as result of temperature differences between the landfill gas and the ambient air. A literature review suggests that a conservative estimate of the volume of condensate to be expected is approximately 1,000 gallons per million cubic feet of gas extracted. At a gas extraction rate of 200 CFM, approximately 300 gallons of condensate may be generated per day of operation. Condensate will be collected in a knockout pot, and drained into the shallow collection trench pump station and thus to the ground water treatment plant for treatment.

A schematic diagram of the proposed interim extraction system is provided as Figure 2. The system will be installed, started up, and monitored by O'Brien & Gere, with support from Mabbett & Associates. O'Brien & Gere's July 1999 Health and Safety Plan will be amended to include these activities, and submitted under separate cover.

Data Collection

Just prior to startup of the extraction system, a round of monitoring will be conducted at select gas monitoring wells to provide a baseline data set for use in evaluating the performance of the interim system. Existing gas monitoring wells GM-2R, GM-3R, GM-4R, GM-5, GM-6, GM-7, GM-8, GM-9, GM-10, GM-11, GM-12, GM-14, GM-15, GM-16, and GM-17 will be screened for landfill gas constituents using a Landtec Model GEM 500 Gas Extraction Monitor, and a photoionization detector (PID). Monitoring will be conducted using the same protocols as used during previous site investigations, and results will be reported for methane, % LEL, carbon dioxide, oxygen, hydrogen sulfide, and VOCs.

After installation and startup of the extraction system, monitoring will be conducted to provide data to assess the system's effectiveness in extracting landfill gas, and in controlling the migration of gas off-site.

During system startup, vacuum measurements will be made at the piping connections to vents GV-8 and GV-1. Measurements of discharge velocity and exhaust gas temperature will also be made at the blower discharge stack, to allow the volumetric flow rate to be calculated. That flow rate, along with intake vacuum, will be compared to the performance curve provided by the blower manufacturer to verify proper operation of the system.

After the blower system has been started up and operated for one day, a series of vacuum readings and landfill gas measurements will be made. Vacuum readings will be collected at gas vents GV-1, GV-8, GV-12, GV-13, and GV-14 to assess the extraction system's operating parameters. Vacuum readings will be made at other nearby vents, including GV-2, GV-7, GV-9, GV-10, and GV-11, to assess if air is being drawn in, which might lead to short-circuiting of the system. The need to temporarily cap these vents will then be evaluated.

At the blower system, exhaust velocity and temperature will again be monitored, to confirm the air discharge rate from the system. Also, the exhaust gas will be screened for landfill gas constituents, using a Landtec Model GEM 500 Gas Extraction Monitor (GEM 500) equipped with a hydrogen sulfide monitoring pod to monitor for methane, % LEL, carbon dioxide, oxygen, and hydrogen sulfide. Monitoring will be conducted by connecting flexible tubing to the discharge stack sample port, allowing the internal sample pump in the GEM 500 to withdraw air from the stack. In addition, a photoionization detector (PID) will be used to screen the blower discharge for VOCs. Once the instrument readings stabilize, the data will be recorded on field data sheets.

Following the readings at the gas vents and blower system, vacuum readings will be taken at gas monitoring wells GM-2R, GM-3R, GM-4R, GM-5, GM-6, GM-7, GM-8, GM-9, GM-10, GM-11, GM-12, GM-14, GM-15, GM-16, and GM-17. At the same time, these monitoring wells will be monitored for landfill gas, using the GEM 500 and the same protocols as used during the previous site investigations.

The gas vent, blower system, and gas monitoring well readings described above will be repeated on the second and third days following system startup, and then weekly for the first month of operation. The same set of readings will be taken at the end of the second and third months of operation. Based on evaluation of the collected data, and observations made during the period of operation of the interim extraction system, the PMC may propose modifications to the method of operation. For example, it may be warranted to make adjustments to the gas extraction rate, or to extract gas from different wells. Similarly, based on the ongoing evaluation of collected data, the PMC may propose modifications to the monitoring program (frequency, location, or parameters). This program flexibility, and the ability to make adjustments to the initial plan, are consistent with the objectives of the field pilot study. Any proposed modifications will be discussed with USEPA prior to implementation.

Concurrently with the gas extraction system monitoring, air monitoring will be conducted in the breathing zone near the blower system, near the southeast corner of the ground water treatment plant, and at a point approximately 50 feet downwind of the blower discharge. Monitoring will be conducted for VOCs, using a PID, and for methane and hydrogen sulfide, using the Landtec GEM 500. Sustained exceedances of the interim action levels outlined below will be used as triggers to shut the system down, and to develop a plan for off-gas controls:

Methane:	10% of LEL (based on 310 CMR 19.132(4)g)
Hydrogen Sulfide:	10 ppm (based on the TLV)
VOCs:	5 ppm (based on the HASP for construction)

It should be noted that the odor threshold for hydrogen sulfide is less than 0.01 ppm, well below the proposed interim action level. Accordingly, if offsite nuisance odors are observed, the system will be shut off and a method to control odors developed.

Data Evaluation

The data that is collected will be assessed and evaluated on an ongoing basis during the performance of the pilot trial of the interim gas extraction system. The general approach for evaluating the data is summarized below:

1. The landfill gas screening performed at selected perimeter gas monitoring wells prior to system startup will be used to provide a baseline data of existing site conditions.
2. Vacuum readings made at selected gas vents will be assessed to determine whether the system is effectively inducing a negative pressure condition within the landfill, especially along the western side, and to estimate the radius of influence of the extraction system. Vacuum measurements from vents remote from the extraction point will also be used to assess whether short-circuiting is occurring and allowing outside air to be drawn in.
3. Vacuum readings at perimeter gas monitoring wells may be useful in evaluating whether the system's influence reaches to the edge of the landfill.
4. The extraction system exhaust will be screened for landfill gas parameters, and generally evaluated as follows:
 - a. Methane concentrations will be evaluated to assess the system's effectiveness in extracting gas from the landfill.
 - b. VOC and hydrogen sulfide concentrations will be reviewed to assess the need for off-gas controls on a permanent system. If appropriate, an air sample may be collected and analyzed for VOCs to develop a better estimate of emission rates.
 - c. The trends in oxygen concentrations will be reviewed to assess whether ambient air is being introduced through short-circuiting. It is anticipated that oxygen levels should drop over time after the system is started up.
5. The results of landfill gas screening at the selected perimeter gas monitoring wells will be compared to the baseline data to assess the system's effectiveness in controlling the migration of gas from the landfill.

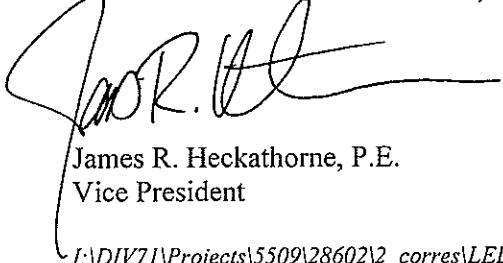
Schedule for Corrective Action Implementation

It is anticipated that the interim active gas extraction system would be mobilized to the Site within two weeks of USEPA approval of this Corrective Action Design. The Board of Health will be notified prior to the commencement of gas extraction activities. Installation of the system, including piping and electrical, could be completed in approximately one week, at which time the system would be started up. The interim system will be operated for three months, during which time data would be collected, as described above, for preparation of a report. Within 45 days of completion of the three months of operation, the report will be submitted to USEPA, which will include an evaluation of collected data, and recommendations for a permanent corrective action.

Mr. David O. Lederer
November 15, 2002
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Very truly yours,

O'BRIEN & GERE ENGINEERS, INC.

A handwritten signature in black ink, appearing to read "J.R. Heckathorne", with a long horizontal flourish extending to the right.

James R. Heckathorne, P.E.
Vice President

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Attachment

cc: S. Wood E. Vaughn S. Alfonse
E. Bertaut D. Dwight J. Shanahan

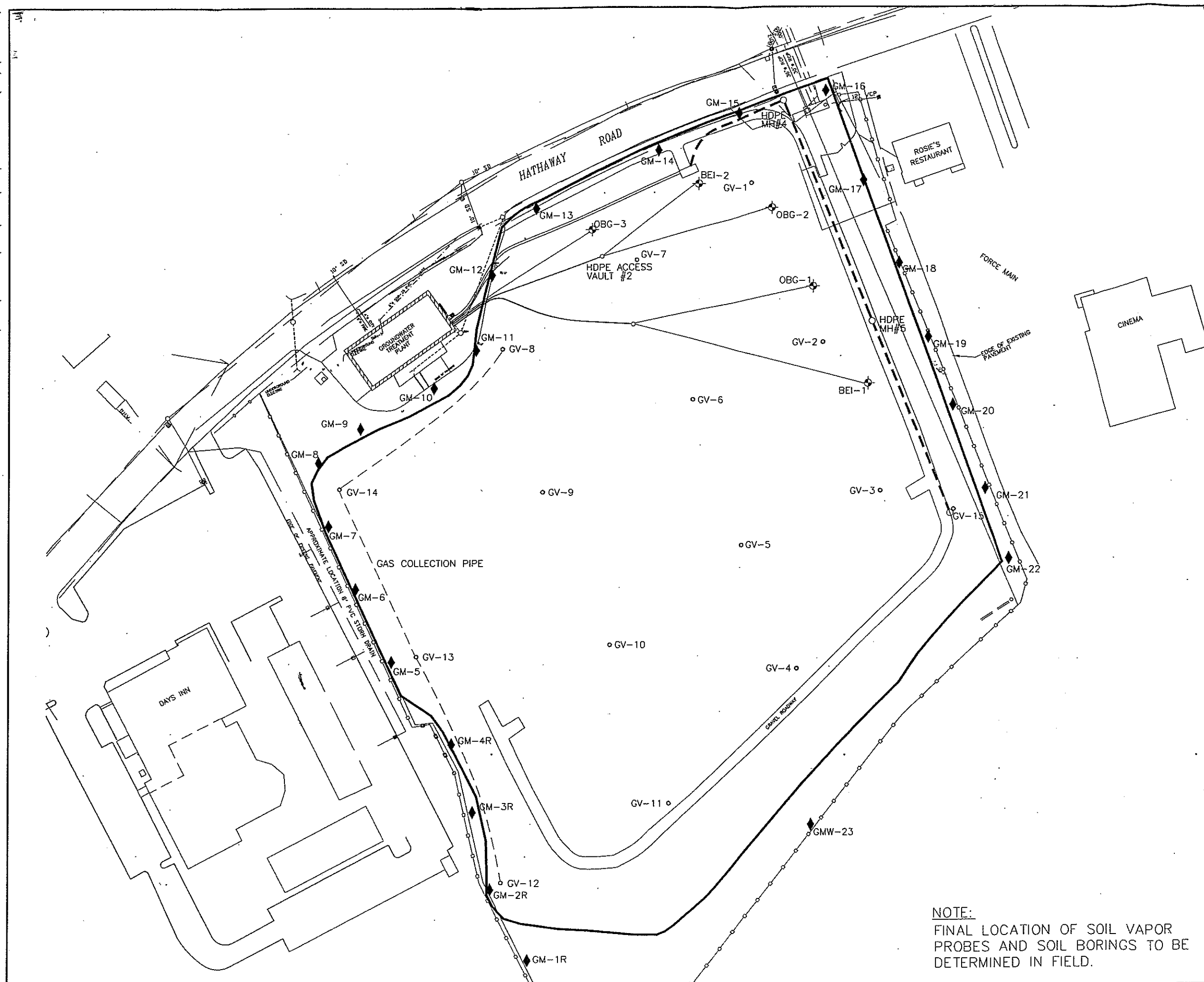


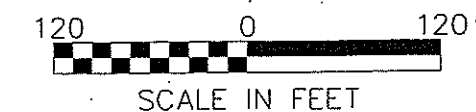
FIGURE 1

LEGEND

- GAS VENT
- ◆ GAS MONITORING WELL
- GAS COLLECTION PIPE
- PROPERTY BOUNDARY
- LIMITS OF CAP
- - - SHALLOW COLLECTION TRENCH

SULLIVAN'S LEDGE
SUPERFUND SITE
NEW BEDFORD, MASS.

GAS VENT AND
MONITORING WELL
LOCATION PLAN



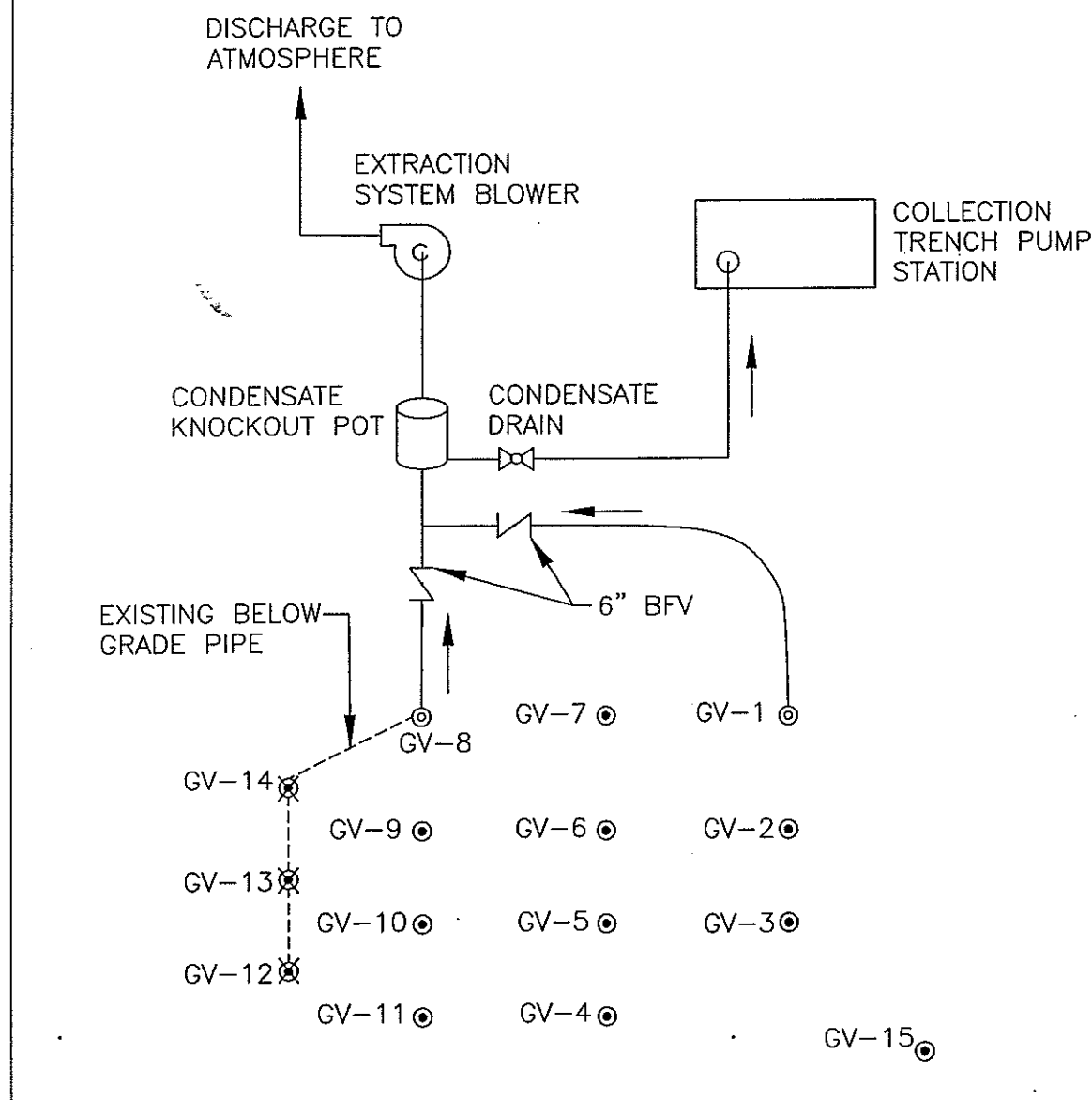
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OCTOBER 2002



NOTE:
FINAL LOCATION OF SOIL VAPOR
PROBES AND SOIL BORINGS TO BE
DETERMINED IN FIELD.

LEGEND

- ⊙ EXISTING GAS VENT
- ⊙ EXISTING VENT TO BE CONNECTED TO EXTRACTION SYSTEM
- ⊗ EXISTING VENT TO BE TEMPORARILY CAPPED



SULLIVAN'S LEDGE
SUPERFUND SITE
NEW BEDFORD, MASSACHUSETTS

PROPOSED INTERIM GAS EXTRACTION SYSTEM SCHEMATIC

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NOT TO SCALE

